

Code of Practice
For
Shell Egg, Production, Grading,
Packing and Distribution

Australian Egg Corporation Limited

Acknowledgements

This voluntary Code of Practice has been prepared, after extensive consultation with the egg industry by a working party. The Working Party comprised representatives from the egg industry, the Victorian Department of Human Services, the Victorian Department of Natural Resources and Environment and the University of Melbourne.

The Australian Egg Corporation Limited would like to thank the Working Party and egg producers in Victoria for their contribution to the development of this Code.

COD-001-02	
Issue Date:	23 August, 2010
Page:	1 of 1

Index

Module Number

1. **Index** 001
2. **Introduction** 002
3. **General** 003
 - 3.1 Review Procedures
 - 3.2 Coding System
 - 3.3 Complying with the Code
 - 3.4 Courses
 - 3.5 Legislation
4. **Food Safety Hazards** 004
 - 4.1 Biological
 - (a) Salmonella
 - (b) Sources of Salmonella
 - (c) Contamination of Eggs
 - (d) Outbreaks of Salmonella Food Poisoning
Associated with Eggs
 - 4.2 Physical
 - 4.3 Chemical
5. **Personnel Hygiene Requirements** 005
 - 5.1 Staff
 - 5.2 Visitors
6. **Poultry and Packing Buildings** 006
 - 6.1 Location
 - 6.2 Construction
 - (a) Poultry Buildings
 - (b) Packing Stations
 - 6.3 Pest Control of Buildings
 - 6.4 Cleaning and Sanitising Buildings and Equipment
 - 6.5 Domestic Animals
 - 6.6 General Housekeeping
7. **The Flock** 007
 - 7.1 Purchasing Laying Hens from Breeding Flocks and
Hatcheries
 - 7.2 The Birds
 - 7.3 Poultry Transport
 - 7.4 Disposal of Farm Waste
 - (a) Birds
 - (b) Manure
 - 7.5 Feed and Water
 - 7.6 Litter and Nesting Materials

COD: 001-02	
Issue Date:	23 August, 2010
Page:	1 of 2

8. Egg Collection Process	008
8.1 Preparation of Collection Belt Before Run	
8.2 Collection	
8.3 Removal of Eggs with Visual Faults	
8.4 Egg Storage and Transport on Farm	
8.5 Packing	
(a) Cleaning/Washing of Eggs	
(b) Visual Checking and Grading	
(c) Disposal of Rejected Eggs	
(d) Packing for Sale	
(e) Storage and Delivery to Customer	
8.6 Advice to Retailers and Consumers	
(a) Retail Premises	
(b) Caterers and at Home	
Appendix 1: Food Safety Program	009
Appendix 2: Sanitising Dilutions of Concentrated Chlorine for Cleaning	010
Appendix 3: Minimum Egg Quality Systems	011
Appendix 4: Standard E1: Eggs, Liquid Eggs and Liquid Egg Products	012
Appendix 5: Example of Egg Washing and Process Temperatures	013
Appendix 6: Guidelines for Retailers and Wholesalers	014
Appendix 7: Guidelines for Caterers, Processed Food Companies, Food Service Organisations and the General Public	015
Appendix 8: Glossary	016

2. Introduction

There have been a number of outbreaks of infectious diseases associated with the consumption of eggs. These have highlighted the need to develop Codes of Practice: one Code focussing on shell egg production and another Code on the commercial production of egg products. This Code of Practice (“the Code”) provides guidance on the hygienic production, storage, packaging and distribution of shell eggs intended for human consumption and sets the minimum standards of hygiene. It is expected that these standards will be met.

The Code aims to prevent contamination and deterioration in the quality of shell eggs and has been designed to cover different types of egg production systems from small free range farms to intensive cage systems. The Code is a flexible document and recognises that hygiene control may be more difficult in “non-cage” egg production systems.

The Code also reflects and supports existing Commonwealth, State and Territory food safety related legislation. Because the legislation reflects minimum standards, where it is considered appropriate and in the public interest, this Code proposes higher standards. AECL expects members to abide by this Code.

A Working Party consisting of representatives from industry, Victorian Department of Human Services (DHS), the Victorian Department of Natural Resources and Environment (NR & E) and the University of Melbourne have created the Code. The Code uses a Hazard Analysis Critical Control Point (HACCP) approach, which is also referred to as a “Food Safety Program”, to ensure that a hygiene chain is maintained from feed to breeding flocks/hatcheries through to the final consumer.

A HACCP system is a cost-effective technique used by processors to ensure product safety. In this instance, the shell egg production, grading and packing process is broken down into steps. Hazards are then identified in each step. A hazard is something that could affect the product in a way that may cause harm to the consumer and consequently affect the success of the business.

For each hazard an appropriate control measure is listed and those that are deemed to be critical to the production of safe eggs are identified as control or safety points. (Examples of these safety points are indicated in the flow diagram in **Appendix 1(b)**). The system must then be monitored to ensure that it is operating effectively.

Although most poultry diseases do not affect humans, to ensure the production of a safe product, it is expected that egg producers will only obtain healthy and disease free birds, wherever possible. It is expected that packers will only receive eggs from producers who comply with the Code. It is expected that packers will ensure that instructions for the hygienic storage of eggs are passed on to their retailer/caterer customers and to the final consumer.

COD: 002-02	
Issue Date:	23 August, 2010
Page:	1 of 1

3. General

3.1 Review Procedure

The Code will be reviewed from time to time in the light of new knowledge, changing industry practice and changing health standards. The code is viewed as a living document, which will be updated to reflect the latest scientific and field based developments. The review process will also recognise requirements of the **Food Standards Code, 1987** as they relate to shell eggs and egg products. Input is encouraged from stakeholders to ensure that the Code retains its relevance. Updates will be endorsed at General Meetings of the Australian Egg Corporation Limited.

3.2 Coding System

On the bottom right hand side of each page is a box showing the following: -

- COD Number. The first three digits of the COD Number relate to the module of the Code. Module numbers are shown on the right hand of the page of the index and relate to the headings in the Code. The last two modules refer to the version number of the particular page. Therefore, the number "02" after the dash means that this is the second version of this particular page;
- Issue Date. This refers to the date on which the latest version of this particular page was printed and distributed;
- Page. This refers to a page number in the module (the number before the word "of") and the number of pages in the module (the number after the word "of").

Therefore, the coding system will be an indication of the nature, manner and outcome of any review of the code.

3.3 Complying With the Code

The Code is a voluntary Code of Practice which will help egg producers with the general provisions of the food act and/or regulations and other relevant State/Territory legislation. It is expected that all egg producers will comply with the code. Egg producers shall develop their own program for the implementation of the Code so that practices in the Code are implemented within the following time periods:-

- By 1 July 2007 for structural requirements;
- By 1 July 1999 for other requirements.

Help is available on all aspects of the Code from industry representatives or suitably qualified professionals.

3.4 Courses

Courses to assist with compliance with the Code are available for egg producers. All egg producers shall attend a course relevant to their process. Below is a list of contact points for relevant courses.

COD: 003-02	
Issue Date:	23 August, 2010
Page:	2 of 2

For information about the following courses: -

- Hygiene for egg producers;
- General food hygiene;
- Hazard Analysis Critical Control Points (HACCP).

contact: -

1. Local Council Environmental Health Department
2. Local TAFE College
3. State/Territory departments of Health/Human Services
4. State/Territory departments of Agriculture/Primary Industries
5. Major Egg Organisations
6. Australian Egg Corporation Limited

3.5 Legislation

Legislation covering eggs is found under the general provisions of the food act and/or regulations operating in the States and Territories and the **Food Standards Code, 1987** (with amendments). The general requirements of the State/Territory legislation covers matters such as the fitness for use, quality and adulteration of eggs.

The **Food Standards Code, 1987** (with amendments) currently states that cracked eggs must not be sold for human consumption unless they are to be further processed by pasteurisation in accordance with Section E1, clauses (2), (3) and (4). (See **Appendix 5**).

COD: 003-02	
Issue Date:	23 August, 2010
Page:	2 of 2

4. Food Safety Hazards

A hazard is anything that could cause harm to the consumer. Hazards can be biological (for example, *Salmonella*), physical (for example, glass particles), or chemical (for example, cleaning chemicals).

4.1 Biological

Biological hazards are the main hazards that can affect eggs. This document therefore concentrates mainly on reducing biological hazards during the egg production process.

(a) *Salmonella*

Salmonella is the main pathogenic bacterium associated with eggs. The illness caused by this bacterium (salmonellosis) can affect anyone; however, it is more commonly reported in children under five years of age. Symptoms are often more severe in the elderly, the very young and people with other medical conditions.

Symptoms: *The most common symptoms are diarrhoea, fever, stomach cramps, nausea, vomiting and headache. In extreme cases the illness can result in death.*

(b) Sources of *Salmonella*

The primary sources of *Salmonella* are the intestinal tracts of animals and birds. Animals may become infected from the consumption of contaminated feed or water or contact with infected animals.

(c) Contamination of Eggs

Pathogenic bacteria such as *Salmonella* may contaminate eggs either by: -

- Movement of bacteria through the shell. This is particularly so when the shell is soiled or damaged; or
- Infection of the egg during its development in the hen. Strains of a type of *Salmonella* (*Salmonella* Enteritidis) can affect the reproductive tissue in hens with the result that eggs may already be contaminated at the time of laying. This type of *Salmonella* has caused many food poisoning outbreaks overseas, but it is not endemic in Australia.

Therefore, it is important that effective hygiene measures are adopted for the production of eggs and egg products in Australia.

(d) Outbreaks of *Salmonella* Food Poisoning Associated with Eggs

Outbreaks have been traced to: -

- Use of raw eggs, for example in mayonnaise, egg nogs or gelati;
- Eggs only undergoing a mild cooking process, for example, in hollandaise sauce or soft boiled eggs;

COD: 004-02	
Issue Date:	23 August, 2010
Page:	1 of 2

-
- Cross contamination, for example, in bakeries where uncooked product (such as imitation cream) have been prepared using utensils used for uncooked egg mix;
 - Unhygienic methods of production of shell eggs.

4.2 Physical

A shell and therefore the likelihood of foreign bodies, (such as glass, metal, rodent droppings, hair, insects, larvae, wood, splinters and rust), protect eggs affecting them is small. The risk lies in the possibility of foreign objects on the outside of the shell getting into the egg when the egg is cracked.

Some foreign bodies such as blood spots are present in the egg when they are laid. These could be present in the egg at the time of sale if eggs are not carefully checked during grading. Blood spots and meat spots are unlikely to represent a serious public health problem.

4.3 Chemical

Cleaning chemicals and pest control chemicals/baits are toxic and can have harmful effects if consumed. They can also 'taint' the flavour of food.

Chemical contamination can arise from the incorrect use of sanitisers during general cleaning and washing of eggs and also through the incorrect storage of chemicals. This could result in these chemicals entering the egg through the pores in the shell.

COD: 004-02	
Issue Date:	23 August, 2010
Page:	1 of 2

5. *Personnel Hygiene Requirements*

5.1 Staff

Disease causing bacteria can be spread by poor hygiene practices. All staff must carry out good personal hygiene practices to prevent the spread of disease.

- All farm staff (including relief and casual staff) shall receive training in hygienic practices and the need to maintain the standards of hygiene as set out in the Code;
- Staff shall wash their hands before and after egg collection. Dead bird removal or other practices that may lead to cross contamination must not be carried out during egg collection. Smoking and the consumption of food shall not be allowed except in specified areas;
- Each farm shall produce its own operations manual for use by staff. It shall contain working instructions and a check list of routine hygiene and husbandry tasks;
- Adequate hand washing and toilet facilities are to be provided and their appropriate use encouraged;
- Protective clothing shall be provided, changed and laundered regularly.

5.2 Visitors

Visitors are a potential means of introducing infection onto farms and packing stations by moving from dirty to clean areas and if they also visit other poultry farms or packing stations. The proprietor or manager shall ensure that visitors carry out strict hygiene precautions.

- Visitors shall be kept to an absolute minimum and must be subject to the same degree of hygiene control as the staff. Washable or disposable overalls and boots shall be provided by the farm or packing station for visitors and washed or disposed of after use.

COD: 005-02	
Issue Date:	23 August, 2010
Page:	1 of 1

6. *Poultry and Packing Buildings*

6.1 Location

Appropriate steps are to be taken to ensure buildings are located in areas that do not expose eggs to risk of contamination.

- Where possible the poultry and packing buildings shall be located away from other farm holdings on site. It is expected that the perimeter of the farm will be fenced and gated securely with parking facilities provided away from the building;
- Signs restricting access to poultry houses, egg grading, packing and storage areas shall be displayed;
- The site shall be kept clean and tidy.

6.2 Construction

Buildings should be constructed so that they can be kept clean to prevent the build up of microorganisms and the attraction of pests.

(a) Poultry Buildings

- Buildings shall be of sound structure, in good repair and constructed in a way which enables effective cleaning to occur;
- Wherever possible all surfaces and equipment shall be constructed from smooth and impervious material that can be easily cleaned;
- Adequate hand washing facilities with a supply of hot and cold running water shall be provided, together with soap and suitable facilities for drying of hands (such as disposable paper towels);
- It is expected that all insulation materials shall be rot proof and odourless;
- Wherever possible, floors shall be rot and water proofed. It is expected that floors will be easy to clean and laid in a way, which facilitates the drainage of water. For deep litter environments where floors cannot be rot and water proofed, it is expected that floors will be kept in a clean and moisture free condition;
- Ancillary rooms (for example, storage and grading rooms, food stores, egg stores, changing rooms, break rooms, toilets and other stores) shall be of sound structure, individually separated and with appropriately sealed doors.

(b) Packing Stations

- The packing station shall be reserved for the handling and storage of eggs;
- All surfaces and equipment shall be constructed from smooth and impervious material that is able to be easily cleaned;

COD: 006-02	
Issue Date:	23 August, 2010
Page:	2 of 3

- Adequate ventilation and lighting shall be present and be able to be properly cleaned and disinfected;
- It shall be of sufficient area for the volume of work carried out to be equipped with all the necessary technical equipment to ensure proper handling of eggs;
- The premises and equipment shall be kept clean, in good repair and free of extraneous odours;
- Adequate hand washing facilities with hot and cold running water, soaps and suitable facilities for drying of hands (such as disposable paper towels) shall be present.

6.3 Pest Control of Buildings

It is important that rodents, insects and birds are controlled because they can all spread diseases, which affect hens.

- Packing areas must be pest proofed;
- It is expected that poultry houses and ancillary buildings will be wild bird and rodent proof. Effective general measures shall be taken to control pests and their breeding areas. In free range production areas, measures shall be carried out to reduce and control unwanted pests. Particular attention shall be paid to good farm management practices, including baiting for rodents;
- Low lying vegetation around buildings, including in or around ditches, shall be kept under control to discourage pests;
- Baits must not be positioned or stored where they could expose eggs, poultry feed, or water to risk of contamination. All bait and bait boxes shall be labelled "poison". Suitable protective clothing shall be worn when handling pest control chemicals;
- A pest control program shall be put in place and a log book kept of records of inspections and treatment. It may be necessary to employ a pest control operator to monitor the premises;

6.4 Cleaning and Sanitising Buildings and Equipment

Cleaning removes matter conducive to the growth of microorganisms and removes materials that would provide food or harbourage for pests. Sanitising is the process of destroying pathogenic microorganisms. Effective cleaning and sanitising will minimise the risk of eggs and hens becoming infected with pathogenic organisms.

- A cleaning schedule shall be drawn up for all poultry houses, packing and grading areas. Cleaning tasks, frequency and sanitisers to be used shall be described. A system for recording adherence to schedules shall be established and be adhered to. This system shall include the name and signature of the person responsible;

COD: 006-02	
Issue Date:	23 August, 2010
Page:	3 of 3

-
- Cleaning and sanitising of the plant and equipment shall be undertaken in accordance with the current Australian Standard 4709-2001 “**Cleaning and Sanitising of Plant and Equipment in the Egg Handling and Processing Industry**”;
 - Cleaning and sanitising of poultry houses shall be carried out between flocks for single aged houses or at a batch turn around (at least once yearly) for multi-aged houses;
 - Sanitising may be by use of chemical sanitiser (for example, 100-200 ppm of available chlorine – see **Appendix 3** for dilution factors) or by steam cleaning. Particular attention shall be paid to equipment such as ventilation systems, feeders, drinkers, waterlines and header tanks, all of which must be sanitised;
 - Sanitisers shall be stored in labelled containers away from any areas where eggs are stored. Sanitisers shall be disposed of in accordance with State/Territory environmental protection guidelines;
 - An effective, frequent and well maintained system of manure removal shall be present to reduce the risk of faecal contamination of eggs and feed troughs.

6.5 Domestic Animals

It is important that the presence of domestic animals is controlled to prevent the risk of spread of disease to your flock.

- Domestic animals shall not be allowed into poultry houses or ancillary buildings. In free ranging areas, domestic animals are permitted if they are required for protection of the flock.

6.6 General Housekeeping

It is important that equipment is stored so that the area can be maintained in a clean and sanitary condition.

- A clean and tidy store of equipment shall be maintained. All obsolete equipment and rubbish shall be removed.

COD: 006-02	
Issue Date:	23 August, 2010
Page:	3 of 3

7. *The Flock*

7.1 Purchasing Laying Hens from Breeding Flocks and Hatcheries

To ensure eggs are safe, hens laying the eggs shall, to the best of the purchaser's knowledge, be healthy and free from disease. Egg producers shall ensure that the proprietors of premises where the hens are purchased are engaging in hygienic practices. All breeders, hatcheries, rearers and egg producers shall keep birds in accordance with the ***Model Code of Practice for the Welfare of Animals: Domestic Poultry, 4th Edition***, Standing Committee on Agriculture and Resource Management, Animal Health Committee (available from the Australian Egg Industry Association).

It is recommended that a written assurance be sought from the breeder or hatchery regarding the quality of the chicks or hens that are being purchased. The following list provides some examples of practices that are expected to be carried out by the hatchery, breeder or rearer: -

- Unique genetic material shall be kept in more than one building and preferably on more than one holding or site;
- Adequate distance shall be present between buildings used for pullet rearing and egg production;
- Adequate ventilation shall be provided at the breeder/hatchery premises;
- Only clean eggs which have been sanitised shall be selected for incubation;
- At hatcheries, eggs shall be collected from breeding farms regularly;
- In a hatchery a one way flow of eggs and chicks shall operate.

7.2 The Birds

Hens for laying shall be maintained in a healthy state to ensure a safe egg supply.

- Vaccination programs shall be developed and implemented in consultation with the hatchery, which supplies birds. Any signs of unusual illness or poor health in a flock shall be immediately drawn to the attention of a veterinarian or the responsible department in the State or Territory in which the farm is based;
- Sick or injured birds shall be culled promptly;
- Eggs for human consumption shall be derived only from healthy stock. When medication has been given to a flock, eggs shall not be sold during the recommended withholding period as stated on the label.

COD: 007-02	
Issue Date:	23 August, 2010
Page:	1 of 3

7.3 Transport

Poultry must be transported in such a manner so as to prevent the transmission and introduction of disease.

- All vehicles (and equipment) used for transporting poultry are high risk items and shall be cleaned and sanitised before and after each use;
- Only use transport contractors who have an established cleaning program in place;
- Transport vehicles and equipment used for transporting poultry shall not be used for any other purpose;

Transportation shall be in accordance with the ***Model Code of Practice for the Welfare of Animals: Land Transport of Poultry.***

7.4 Disposal of Waste

Dead birds and manure must be disposed of hygienically and away from live flocks to prevent disease transmission. Sanitisers must be disposed of so that they do not contaminate the environment.

Birds

- Dead birds shall be collected promptly and placed in waterproof, leakproof containers prior to incineration, burial or other approved outdoor method, away from the poultry shed.

Manure

- Litter and/or poultry manure can be removed off site, spread on surrounding land with an effective buffer distance to the poultry shed or stored on site in a dry weatherproof building at an effective buffer distance from poultry sheds. In the case of mobile shedding a buffer distance is less relevant.

7.5 Feed and Water

To ensure your hens stay healthy and free from disease it is important that feed and water are not contaminated with pathogenic bacteria that can infect your poultry flock.

- Feed shall only be sourced from suppliers who operate within the principles of good manufacturing practice;
- Vehicles used for carrying raw ingredients shall not be used for carrying prepared feed until they have been effectively cleaned and sanitised between use;

COD-007-02	
Issue Date:	23 August, 2010
Page:	2 of 3

-
- All appropriate measures shall be taken to prevent re-contamination of feed during its storage and distribution on the farm. Particular attention shall be paid to the cleanliness of bulk storage bins, feed conveyors, hoppers and chain feeders and the exclusion of rodents from feed. Feed storage silos shall be cleaned at least once a year;
 - Water shall be from a supply that is free from pathogenic bacteria or dangerous chemicals. The delivery system, including any header tanks, shall be enclosed to prevent contamination. **Chlorine can inactivate live virus vaccines and so advice needs to be sought if these vaccines are to be administered through a chlorinated supply.**

7.6 Litter and Nesting Materials

It is important that these materials are not contaminated with pathogenic bacteria at the time of purchase, which can later infect your poultry flock.

- Litter and nesting material shall be obtained from a reliable source and be free from contamination by livestock, wild birds, rodents or other pests;
- Nesting material in free range areas must be frequently changed and maintained in a hygienic state at all times.

COD-007-02	
Issue Date:	23 August, 2010
Page:	3 of 3

8. *Egg Collection Process*

This stage must be carried out effectively to ensure that eggs do not become contaminated, that conditions allowing the growth of microorganisms do not exist and those eggs with faults are identified and removed.

8.1 Preparation of Collection Belt Before Run

- Egg belts shall be constructed so that they can be readily cleaned, serviced and maintained;
- The laying area shall be kept clean and as free as possible from broken eggs;
- Egg collecting belts shall be cleaned at least weekly;
- Equipment used for manual egg collection shall be cleaned at least weekly.

8.2 Collection

- Eggs shall be collected and either manually or automatically packed into clean keys trays or suitable clean containers;
- Egg containers shall not constitute a hazard to health. Containers (such as plastic or paper trays) which are reused shall be of such material and construction as will facilitate thorough cleaning and shall be so cleaned and maintained as not to constitute a source of contamination to the product. Paper trays that are damp, dirty, or contain liquid egg, shall be discarded.
- Eggs shall be collected at least once a day and then stored below 15 °C (+ /- 3°C);
- Eggs shall be handled as little as possible.

8.3 Removal of Eggs with Visual Faults

- All eggs shall comply with the minimum quality standard for eggs in **Appendix 4**.
- Any whole egg with a cracked shell must not be sold unless sold specifically for processing in accordance with Section E1 (2), (3) and (4) of the Food Standards Code, with amendments. (See **Appendix 5**);
- It is recommended that dirty and incubated eggs not be used for human consumption.

COD-008-02	
Issue Date:	30 January 1998
Page:	1 of 5

8.4 Egg Storage and Transport on Farm

Eggs kept on farm must be stored in a way that prevents contamination by and growth of any surviving microorganisms.

- After collection, eggs shall be stored and transported within a system that avoids excessive temperature fluctuations at all stages until they reach the consumer. The recommended temperature for egg storage is below 15 °C (+ /- 3°C) at the farm, during transport and at the retail outlet, in conditions which avoid surface condensation or contamination;
- The temperature of cool rooms and vehicles shall be regularly monitored using thermometers;
- Eggs shall be delivered to a packing station within 96 hours of lay.

8.5 Packing

(a) Cleaning/Washing of Eggs

Washing removes the bloom from the egg shell making it easier for bacteria to get inside the egg through the pores. There is therefore a greater risk of bacteria getting into eggs that are washed. The temperature of the wash solution must be kept above that of the egg and its contents to ensure that extraneous matter is not 'sucked' into the egg.

Therefore, it is important that the cleaning or washing process is carried out correctly so that bacteria that could be present on the outside of the shells or chemicals from the sanitiser do not gain entry into the eggs.

Dry Cleaning Eggs

- If eggs are not washed, dirty eggs can be cleaned using a dry abrasive method. A clean, dry, **sanitised** cloth or other suitable material can also be used;
- The equipment used to clean eggs that are not washed shall be sanitised or disposed of on a daily basis.

Wet Egg Washing

- Water used for washing eggs shall be free from pathogenic micro-organisms or toxic chemicals;
- The washing process shall be mechanised and continuous. Eggs shall not be allowed to stand or soak in the wash water. The machine must be cleaned and sanitised after use.

COD-008-02	
Issue Date:	23 August, 2010
Page:	2 of 5

Washing Procedure

Machine Type	Washing	Sanitising	Rinsing
Single Stage		Water temperature 41-44°C. A sanitiser such as a chlorine based sanitiser specifically for use on eggs shall be used. Eggs air dried/mechanically dried.	
Two Stage		Water temperature 41-44°C. A sanitiser such as a chlorine based sanitiser specifically for use on eggs shall be used.	Pathogen free water 2-3°C higher than sanitising water. Eggs air dried/mechanically dried.
Three Stage	Water temperature 41-44°C. Egg detergent.	Water temperature 3-4°C higher than wash water. A sanitiser such as a chlorine based sanitiser specifically for use on eggs shall be used.	Pathogen free water 2-3°C higher than sanitising water. Eggs air dried/mechanically dried.

Appendix 6 provides an example of temperatures used for a three stage shell egg washing and sanitising process.

Detergents/Sanitisers

- Detergents and sanitisers must be suitable for use for egg washing and used in accordance with any instructions issued by the manufacturer.
- The **Australian Standard 4709-2001 “Cleaning and Sanitising of Plant and Equipment in the Egg Handling and Processing Industry”**, outline the properties of suitable sanitisers and detergents for the use in the egg industry. For more information refer to the Australian Standard.

(b) Visual Checking and Grading

It is important that each egg is visually checked so that the quality of eggs leaving the packing and candling process is assured. Equipment used in the grading process must be maintained in a clean condition to prevent the build-up of microorganisms.

- Following washing, eggs shall be candled and visually checked to ensure good quality;
- Checking of quality is to be carried out to satisfy the minimum quality standard shown in **Appendix 4**;
- Rejected eggs shall be placed into a container used solely for these eggs and labelled as such. The container shall be constructed so as to facilitate thorough cleaning and sanitisation after each use;
- Eggs shall be fed onto a manual or automatic egg grading machine, packed according to weight into specified units and labelled with a ‘best before’ date and the name of the packer;
- The grading machine shall be cleaned after use and when necessary.

COD-008-02	
Issue Date:	23 August, 2010
Page:	3 of 5

(c) Disposal of Rejected Eggs

Rejected eggs must be disposed of in a hygienic manner so that eggs for human consumption are protected from risk of contamination.

- Extreme care shall be taken during disposal to protect other eggs from contamination;
- Rejected eggs shall be disposed of at an appropriate tipping site by burial;
- Rejected eggs shall not be used as animal feed unless they are further heat treated to eliminate any pathogens.

(d) Packing for Sale

Care is required during packing to prevent contamination and damage of eggs.

- Egg production facilities, packing units and equipment shall be kept in a hygienic condition and regularly cleaned.
- Eggs shall be dry prior to packing;
- All eggs shall be packed in clean, new, single use trays or cartons and sold under a 'best before' date of a period of six weeks or less from the date of pack on the understanding that the eggs are continually kept under optimal temperature conditions. Eggs should be marketed as soon as possible from the date of lay.

(e) Storage and Delivery to Customer

Eggs must be transported from the farm to the retail outlet in a way that prevents contamination by and growth of any surviving microorganisms.

- After collection, eggs shall be stored and transported within a system that avoids excessive temperature fluctuations at all stages until they reach the consumer. The recommended temperature for egg storage is below 15 °C (+ /- 3°C) at the farm, during transport and at the retail outlet, in conditions which avoid surface condensation or contamination;
- The temperature of cool rooms and vehicles shall be regularly monitored using thermometers;
- Eggs shall be delivered to a packing station within 96 hours of lay.

8.6 Advice to Retailers and Consumers

To ensure the safety and quality of eggs is maintained after leaving the packing station, it is important that they are correctly stored at the retail premises and at the consumer's home.

COD-008-02	
Issue Date:	23 August, 2010
Page:	5 of 5

(a) Retail Premises

- Suppliers shall provide retail and wholesale outlets with advice on safe methods of storing eggs. **Appendix 7** outlines guidelines for the storage and handling of eggs in retail premises.

(b) Caterers and at Home

- Eggs must be stored correctly at home to prevent contamination and to maintain their quality and safety;
- Suppliers shall provide consumers and caterers with advice on safe methods of storing eggs by suppliers, either directly or through retailers. **Appendix 8** outlines guidelines for the storage and handling of eggs by caterers or consumers.

COD-008-02	
Issue Date:	23 August, 2010
Page:	5 of 5

Appendix 1: Food Safety Program

A *Food Safety Program* is a system that identifies, controls and monitors potential hazards to food safety. This system is also referred to as HACCP or *Hazard Analysis Critical Control Point*.

This approach reduces the reliance on end production testing. Food Safety Programs are designed to ensure/maximise the safety of food by identifying food safety risks during production and devising a system to control these risks. The chance of unsafe product entering the market place is thus minimised.

A logical step by step approach is required to look at the operation from start to finish, from the selection of birds to the eggs sold to the consumer. It may be advantageous to employ an independent consultant to help in the development of a Food Safety Program.

Steps In Preparing A Food Safety Program

Step 1: Tasks

Identify the tasks required to operate a commercial egg farm. Use a team of people from the farm to help with this list. Use the person experienced with a certain process to describe the steps involved.

List the steps in order and construct a flow chart. (See example).

Step 2: Potential Hazards

Identify potential hazards. A hazard is anything that may cause harm to the consumer. The Code has identified the majority of hazards that can affect the egg production process. However, the hazards identified are by no means exhaustive and there may be other hazards that specifically affects operations.

A hazard may be: -

- Presence or growth of harmful bacteria, for example, *Salmonella*;
- Chemical contamination, for example, pesticides, bleach;
- Foreign material, for example, glass, metal.

Identify the steps where potential egg contamination can occur.

Step 3: Safety Points

Decide the Safety Points (SPs). These are the points during the production process at which the identified hazard can be controlled. SPs may be referred to in other HACCP documents referred to as Control Points.

The following are examples of SPs: -

Example 1. The prevention of hen's feed contaminated with Salmonellae.

Example 2. The prevention of the risk of entry of pathogenic bacteria through the shell of the egg during the washing process.

COD: 009-02	
Issue Date:	23 August, 2010
Page:	1 of 5

Example 3. The prevention of the growth of surviving pathogenic bacteria during storage.

The attached flow chart shows examples of the safety points for the production of shell eggs on Farm X.

Step 4: Safety Limits

A Safety Limit is a criterion that separates acceptability from unacceptability. Safety Limits are necessary to reduce risks to a safe level or remove them completely. Safety Limits need to be set at each SP that have been identified in Step 3, which are then monitored whenever necessary. "Safety Limits" may also be referred to in other HACCP documents as "Critical Limits".

Safety Limits for the examples above are as follows: -

Example 1. Buy feed from a reputable supplier only and have a purchase specification. For example, specify that you want feed containing no Salmonella bacteria. The safety limit specified to the supplier in this example would be no Salmonellae.

Example 2. Temperature control of the egg wash water. The safety limit would be wash water that is 41-44°C in a three stage process.

Example 3. Eggs should be stored at a constant safe temperature. The safety limit would be a temperature of below 15°C (+ / - 3°C).

Step 5: Safety Checks

Safety points must be checked and recorded.

Safety Checks for the examples above are as follows: -

Example 1. Periodically take samples of the feed for microbiological analysis and record results in a log book. Visually check incoming feed where possible and obtain written assurance that it complies with your purchase specification criteria. Document date, time and condition upon delivery and retain dockets.

Example 2. Take the temperature of the wash water with a thermometer. Check that the temperature is 41-44°C regularly during the process. Record results in a log book.

Example 3: Take the temperature of the packing area/storage room at least once daily and record temperatures in a log book.

Step 6: Corrective Action

Corrective action must be taken if the Safety Limits at each SP are not being met.

Corrective action for the examples above is as follows:

Example 1: If feed does not meet your specified criteria upon delivery then reject it.

COD: 009-02	
Issue Date:	23 August, 2010
Page:	2 of 5

Example 2: If the washing criteria are not met and there is a chance that the eggs could be contaminated, the washing process should be adjusted and the product downgraded.

Example 3. If the temperature rises above the specified temperature then the temperature of the storage packing area should be adjusted. If eggs have been stored at this temperature, for a length of time that could have compromised their quality or safety, then eggs may need to be rejected or sent for further processing.

Work Sheets

Develop working instructions for the SPs and Safety Checks for staff to refer to. These shall be simple and clear.

All staff shall be trained in the Food Safety Program that has been developed. Staff members shall be given individual responsibilities.

Instructions must cover what to do if a SP Safety Limit is not achieved, for example, reject eggs, inform the manager, and place eggs back into cool storage. The work sheet outline in this attachment will assist in the development of instructions relevant to the operation.

Step 7: Monitoring the System

Once a Food Safety Program is established monitoring will be required to ensure that it is running as planned. Carry out microbiological tests periodically on feed and water, wash water and eggs, etc, to ensure that the Food Safety Program is operating effectively. The Program shall be a flexible working document that will require ongoing review and evaluation. An independent auditor shall audit the Food Safety Program.

COD: 009-02	
Issue Date:	23 August, 2010
Page:	3 of 5

Example of a Flow Diagram of the Egg Production Process on Egg Farm X, Showing Safety Points

Receipt	Purchase of Birds, Feed, Litter	SP 1-3
	Provision of Water Supply	SP 4
Storage	Storage of Birds, Feed, Water, Litter	SP 5-8
Process	Point of Lay	
	Check and Clean Belts and Trays, Remove Dead, Sick and Injured Birds	SP 9
	Automated Collection from Belts	
	Pre-select All Visual Faults Whilst Collecting	SP 10
	Pack Eggs into Trays or Container	
	Pack Trays/Container onto Egg Collection Trolley	
	Identify Trolley with Collection Label	
	Hold on Farm in Cooled Store (<15°C [+ / - 3°C])	SP 11
Washing And Packing	Deliver to Packing Station	
	Hold in Cooled Ungraded Egg Store (<15°C [+ / - 3°C])	SP 12
	Washing of Eggs	SP 13
	Feed onto Automatic Egg Grading Machine	SP 13
	Semi-auto Candle and Visually Check, Removing all Faults	SP 14
	Auto Weigh	
	Auto Pack into Individual Specified Units	
	Auto Label (Best Before) and Pack	SP 15
	Transfer to Dispatch	
	Label Transit Package	
	Storage and Transport	SP 16
Retail	Storage at Retail Outlet (<15°C [+ / - 3°C])	SP 17
Consumer	Storage at Consumer's Home or Catering Premises (5°C or Less)	SP 18

Example of a Safety Point Work Sheet

Number	Safety Points	Safety Checks	Safety Limits	Action to Take if Safety Limits are not met

Appendix 2: Sanitising Dilutions of Concentrated Chlorine for Cleaning

Chlorine is a popular and cheap sanitiser, but it is not the only sanitiser available.

Concentrated chlorine with four per cent available chlorine can be diluted using the table below.

Water Volume to be Treated	Concentration Required		
	50 ppm	100 ppm	200 ppm
5 litres	6.25 mls	12.5 mls	25 mls
10 litres	12.5 mls	25 mls	50 mls
50 litres	62.5 mls	125 mls	250 mls

Commercial grade concentrated chlorine with 12.5 per cent available chlorine can be diluted using the table below:

Note: Calculations are based on 10 per cent available chlorine as sodium hypochlorite loses strength on storage.

Water Volume to be Treated	Concentration Required		
	50 ppm	100 ppm	200 ppm
5 litres	2.5 mls	5 mls	10 mls
10 litres	5 mls	10 mls	20 mls
50 litres	25 mls	50 mls	100 mls

For example, to achieve a concentration of 100 ppm in 10 litres of water using a chlorine solution of 4 per cent available chlorine, add 25 mls of chlorine to 10 litres of potable tap water and mix. Using a 12.5 per cent chlorine solution add 10 mls of chlorine to 10 litres of water to achieve a concentration of 100 ppm.

Note: A new batch of chlorine mixture must be made up each time cleaning occurs because chlorine dissipates on storage. Liquid chlorine based sanitisers should be stored in a cool dark place.

Appendix 3: Minimum Quality Standards

Visual Appearance

Eggs shall be free from dirt or stains. Shells shall not be cracked, thin, rough or misshapen.

Internal Characteristics

Yolk should be deep yellow-gold in colour. Eggs shall be free from blood or meat spots.

Grading

Eggs are to be graded by weight and labelled accordingly.

Packed Eggs

The individual egg cartons are to be stamped with a legible 'best before' date code. (It is important to ensure that the ink used to stamp the eggs is made from a non-toxic material). A code identifying the packing station and farm shall be marked on the egg. An alternative method may be used to enable the eggs to be traced back to the packing station and farm. All farms shall ensure that they have an effective trace back procedure for their eggs that can be put into action in the event of a recall.

All outer cartons shall be labelled with a production code ('packing date' or 'best before' date), weight details, number of eggs and name and address of packer.

COD: 011-02	
Issue Date:	23 August, 2010
Page:	1 of 1

Appendix 4: Standard E1

From Food Standards Code, 1987 (With amendments – October 1993) Australia and New Zealand Food Authority (previously National Food Authority)

Part E: Eggs, Liquid Eggs and Liquid Egg Products

- (1) (a) Save where, in this Code, the contrary intention appears –
- (i) 'egg' means the egg of any avian species ordinarily consumed by humans;
 - (ii) 'liquid egg' means whole egg removed from the shell. The term includes such a product that is frozen or chilled but does not include reconstituted dried egg;
 - (iii) 'liquid yolk' means the yolk of egg separated as efficiently as is practicable from the white thereof;
 - (iv) 'liquid white' means the white of egg separated as efficiently as is practicable from the yolk thereof;
 - (v) 'egg white mix' means a mixture of liquid white with some or all of the components specified in paragraph (c).
- (b) for the purposes of this Code, liquid white and dried liquid white may contain triethyl citrate in proportion not exceeding 1.25g/kg;
- (c) egg white mix may contain –
- (i) not more than –
 - (A) 5g/kg in total of the modifying agents specified in Group I set out in Standard A10;
 - (B) 20g/kg in total of the modifying agents specified in Group II set out in Standard A10;
 - (C) 10g/kg in total of the modifying agents specified in Group III set out in Standard A10;
 - (ii) modifying agents specified in Group VI set out in Standard A10;
 - (iii) gelatine;

COD: 012-02	
Issue Date:	23 August, 2010
Page:	1 of 4

-
- (d) deleted
 - (e) Any whole egg the shell of which has been cracked, must not be sold unless sold specifically for processing which involves or includes one of the methods of pasteurisation by heat treatment specified in clauses (2), (3) and (4).
- (2) Liquid egg or a mixture of liquid yolk and liquid white shall not be sold or used in the manufacture of food unless it has been pasteurised by being retained at a temperature not lower than 64°C for at least 2.5 minutes and immediately rapidly cooled to a temperature not greater than 7°C.
- (3) Liquid yolk shall not be sold or used in the manufacture of food unless it has been pasteurised by being retained at a temperature not lower than 60°C for at least 3.5 minutes and immediately rapidly cooled to a temperature not greater than 7°C.
- (4) (a) subject to clause (5), liquid white must not be sold or used in the manufacture of food unless it has been pasteurised by being retained at a temperature not lower than 55°C for at least 9.5 minutes and immediately rapidly cooled to a temperature not greater than 7°C;
- (b) subject to clause (5), egg white mix must not be sold or used in the manufacture of food unless it has been –
- (i) pasteurised by being retained at a temperature not lower than 55°C for at least 9.5 minutes and immediately rapidly cooled to a temperature not greater than 7°C; or
 - (ii) made from liquid white which has been pasteurised in accordance with sub-clause (a);
- (5) (a) Clauses (2), (3) and (4) do not apply to a non-retail sale of liquid egg products where –
- (i) the respective liquid egg products are made entirely from eggs in the shells of which –
 - (A) are substantially free from stain, dirt and other foreign matter; and
 - (B) have not been cracked prior to preparation; and
 - (ii) the label on or attached to the package of the liquid egg product includes the statement, in type of 6mm –

‘WARNING: UNPASTEURISED’

immediately preceding or following the prescribed name of the product.

COD: 012-02	
Issue Date:	23 August, 2010
Page:	2 of 4

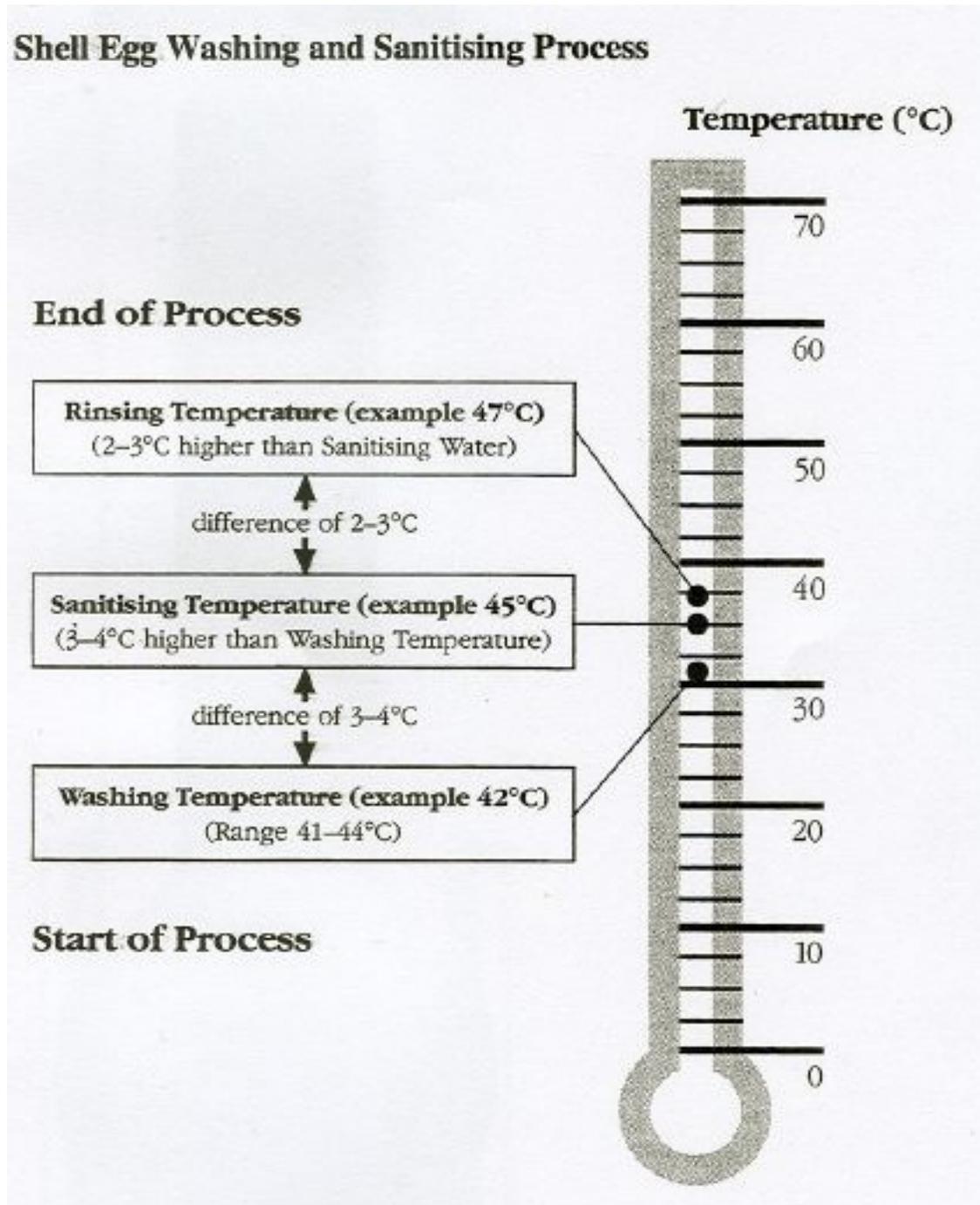
-
- (b) Clauses (2), (3) and (4) do not apply to liquid egg products used in the preparation of another food where the respective liquid egg products –
- (i) are made entirely from eggs the shells of which –
- (A) are substantially free from stain, dirt and other foreign matter; and
- (B) have not been cracked prior to preparation; and
- (ii) either –
- (A) are for use without delay in a food which is itself for immediate consumption; or
- (B) are used in a food which itself is pasteurised or which otherwise undergoes a treatment equivalent to pasteurisation.
- (6) Pasteurised liquid egg or a mixture of liquid yolk and liquid white or a mixture of liquid yolk and egg white mix, when tested as described in Section 11 of AS 1383 – 1974, Methods for the Chemical Examination of Eggs and Egg Products, must yield after Step 11.7.4(c) a solution of blue-violet colour which measures greater than 3 of a standard Lovibond Comparator Disc 4/26 or equivalent, or which results in an absorbance at 585 nm greater than 0.15 when measured using a spectrophotometer.
- (7) Microbiological Standard
Liquid egg, liquid yolk, liquid white, egg white mix, mixtures of liquid yolk and liquid white and mixtures of liquid yolk and egg white mix when examined by the methods prescribed by clause (8) of this Standard shall –
- (a) have a standard plate count not exceeding 10,000 micro-organisms per gram of the food;
- (b) be free from *Salmonella* in 25 g of the food.
- (8) Methods of Microbiological Analysis
The methods set out in this clause are the prescribed methods with respect to the microbiological examination of eggs and egg products;
- (a) Standard plate count.
Proceed in accordance with the current Australian Standard methods in AS1766. Methods for the Microbiological Examination of Food, save that for the purpose of this method when 5 sample units each consisting of 100g or more of the food are examined as detailed the result shall be reported as ‘not exceeding 10,000 micro-organisms per gram of the food’ when at least 4 of the 5 sample units have a standard plate count not exceeding 10,000 micro-organisms per gram and any remaining sample unit has a standard plate count not exceeding 50,000 micro-organisms per gram;

(b) *Salmonella*

Proceed in accordance with the current Australian Standard method in AS1766. Methods for the Microbiological Examination for Food, save that for the purpose of this method when 5 sample units each consisting of 100g or more of the food are examined as detailed the result shall be reported as “*Salmonella* not detected in 25g of the food” only when no *Salmonella* has been detected in 25g of each of the 5 sample units. For the purposes of this method, the sample units may be examined individually, or pooled.

COD: 012-02	
Issue Date:	23 August, 2010
Page:	4 of 4

Appendix 5: Example of Temperatures Used for a Three Stage Shell Egg Washing and Sanitising Process



Appendix 6: Guidelines for Retailers and Wholesalers

- Eggs are fragile and shall be carefully handled at all stages from receipt on delivery dock to the stockroom and including shelf storage for retail display and sale.

Eggs shall be stored at a temperature below 15°C (+ / - 3°C) in retail premises. If this temperature cannot be achieved, then eggs shall be stored in the coolest part of the premises and be sold within 4 days;

- Eggs shall be stored in their outer boxes or prepacks in a clean, dry place away from strong smelling foods, pre-cooked or raw foods or any possible contaminants;
- Self-serve egg systems are not recommended;
- Eggs shall not be stored or displayed:
 - Near to heat sources, such as refrigerator motors and fan heaters;
 - In shop windows or direct sunlight.
- Hands shall always be washed prior to and after handling eggs;
- Eggs shall be sold in strict rotation, that is, first in, first out;
- Signs of damage shall be investigated and if broken eggs or soiled packaging are not returned, they shall be destroyed. Any such eggs shall be removed in such a way as to avoid contamination of clean, intact eggs;
- Regularly empty and clean the egg display area;
- Food safety training for staff shall include attention to the correct handling of eggs.

COD: 014-02	
Issue Date:	23 August, 2010
Page:	1 of 1

Appendix 7: Guidelines for Caterers, Processed Food Companies, Food Service Organisations and the General Public

- Eggs shall be transported with care. Careless handling of eggs can result in severe damage;
- Eggs shall be stored at *refrigeration temperatures* to maintain the quality of eggs and prevent the multiplication of any bacteria;
- Eggs shall be stored dry in their carton or keys tray and isolated from any pre-cooked raw foods or pungent foods;
- Hands shall always be washed prior to and after handling eggs;
- Once broken out, shell eggs shall be used immediately and shall be used in products that will be further cooked;
- Pasteurised egg shall be used if large volumes of eggs are required;
- Avoid repeatedly moving the same eggs to and from cool conditions. Condensation caused by temperature fluctuations on shell eggs increases the likelihood of bacteria from the shell moving into the egg content;
- Signs of damage shall be investigated. Cracked eggs shall not be used;
- Food hygiene training for staff shall include attention to the correct handling of eggs and the avoidance of cross contamination.

COD: 015-02	
Issue Date:	23 August, 2010
Page:	1 of 1

Appendix 8: Glossary

<i>Bacteria</i>	Single celled microorganisms which cannot be seen with the naked eye. Some bacteria can cause disease.
<i>Batch Turn Around</i>	Flock replacement.
<i>Blood Spots or Meat Spots</i>	Occasionally found in an egg. They are caused by the rupture of a blood vessel during formation of the egg.
<i>Bloom</i>	The coating or covering on the egg shell that seals its pores, helps prevent bacteria from getting into the shell and reduces moisture loss from the egg. When eggs are washed for cleanliness purposes the process removes the bloom.
<i>Buffer</i>	A suitable distance between two areas to prevent the risk of contamination.
<i>Candling</i>	The step in grading that lets the egg grader look inside the egg without breaking it to assess its quality.
<i>Cleaning</i>	Removing contaminating matter, foreign odour or visible residue from a previous operation or process of any contaminating matter of a human or animal origin that would provide food or harbourage for undesirable pests or bacterial growth.
<i>Contamination</i>	The occurrence of any objectionable matter in the product.
<i>Cracked Egg</i>	An egg in which the shell and/or membrane is ruptured.
<i>Cross Contamination</i>	The contamination of an item by another.
<i>Culled</i>	A bird that has been selected from a flock and killed.
<i>Deep Litter System</i>	A system in which birds are confined in a building with access to an area of litter material such as earth, wood shavings, straw, rice hulls, shredded paper, etc.

<i>Egg(s)</i>	Refers to hen's eggs intended for human consumption.
<i>Food Poisoning</i>	An acute illness of sudden onset caused by the recent consumption of contaminated or poisonous food.
<i>Food Safety Program</i>	A system that identifies, evaluates and controls hazards which are significant for food safety.
<i>Grading</i>	Eggs classified according to interior and exterior quality and size.
<i>Hazard</i>	A biological, chemical or physical agent or factor with the potential to cause an adverse health effect.
<i>Hazard Analysis</i>	The procedure used to identify potential hazards and to estimate the severity of the hazard and the likelihood that it will occur.
<i>Header Tank</i>	Storage tank for feed or water sited above a process area.
<i>Hopper</i>	Inverted pyramid or cone through which grain passes.
<i>Hygiene</i>	All measures necessary to ensure the safety and wholesomeness of food at all stages of the food chain (including preparation, processing, packaging, storing, handling, transportation and offering for sale or supply to the consumer).
<i>Microorganism</i>	Single celled organism that cannot be seen with the naked eye and include bacteria, viruses, fungi, etc.
<i>Mobile Shedding</i>	Sheds for the hens used in a free range system that are moved periodically to different locations so that the manure is spread over the land.
<i>Non-Cage Birds</i>	Birds reared in barns or free range (without being in cages).
<i>Pathogen</i>	Disease producing organism.
<i>Pathogenic</i>	Dangerous, harm causing.
<i>Pest</i>	An unwanted insect or small animal that damages food supplies and can spread disease, such as rats, mice, flies, cockroaches and wild birds.

<i>pH</i>	An index used as a measure of acidity or alkalinity. pH can be measured using pH paper.
<i>Rejected Eggs</i>	These include eggs that are cracked, broken, dirty, that have been in an incubator or have been extracted from a carcass, or have a defect such as black rot.
<i>Risk</i>	The assessment of the probability of an adverse hazard or event occurring and the impact of that occurrence in a food.
<i>Safety Point (or Critical Control Point)</i>	A step in a food operation at which control can be applied to prevent or eliminate a food safety hazard or reduce it to an acceptable level.
<i>Safety Limit (or Critical Limit)</i>	A criterion which separates acceptability from unacceptability.
<i>Sanitiser</i>	A substance that is capable of reducing the numbers of viable microorganisms to a level satisfactory for product quality and public health, without adversely affecting the food.
<i>Sanitising</i>	The process of destroying pathogenic microorganisms. (Sanitising is not sterilising).
<i>Silo</i>	Pit or tower for the storage of hen feed.
<i>Vaccine</i>	A preparation of killed or weakened (attenuated) microorganisms which, when inoculated into the body, will stimulate it to produce antibodies to protect against the disease caused by those microorganisms.
<i>Virus</i>	Microscopic pathogen that multiplies in the living cell of the host.